

REMARKS

Further and favorable reconsideration is respectfully requested in view of the foregoing amendments and following remarks.

The specification has been amended on page 33, line 22 to correct a typographical error in a U.S. Patent number. A copy of the first page of U.S. 2,015,115 is attached hereto to demonstrate that this was the patent intended to be cited.

Claims 1 and 10-12 have been amended. Claim 1 has been amended to incorporate the limitation of claim 3, and therefore claim 3 has been canceled. Claim 10 has been amended to incorporate the limitation of original claim 1, thus rendering moot the objection to claim 10, and placing claim 10 in condition for allowance. Claims 11 and 12 have also been amended to incorporate the limitations of original claim 1. New claim 13, which combines the limitations of amended claim 1 and original claim 10, has been added to the application.

The patentability of the present invention over the disclosures of the references relied upon by the Examiner in rejecting the claims will be apparent upon consideration of the following remarks.

Thus, the rejection of claims 1-6 under 35 U.S.C. § 102(b) as being anticipated by Matayabas et al. is respectfully traversed.

The Examiner takes the position that Matayabas et al. teach preparing polyether compounds by reacting 3,4-epoxy-1-butene with an alcohol such as phenol, cresol, hydroquinone, resorcinol, etc. in the present of an acidic catalyst, such as a strongly acidic ion exchange resin.

However, the catalyst used in the reaction of Matayabas et al. is not an anion exchange resin, as required by Applicants' claims. Instead, Matayabas et al. teach the use of a strongly acidic ion exchange resin, such as cation exchange resins. (See column 3, lines 62-66 of the reference.)

For this reason, the invention of the pending claims is clearly patentable over Matayabas et al.

The rejections of claims 1, 2 and 4-9 under 35 U.S.C. § 102(b) as being anticipated by Hirano et al. (JP '729 and US '887) are rendered moot by the incorporation of the limitation of claim 3 into claim 1, since claim 3 is not subject to these rejections.

The rejection of claims 11 and 12 under 35 U.S.C. § 102(b) as being anticipated by Dressler is respectfully traversed.

The Examiner takes the position that Dressler teaches hydroxyalkylated phenols which are purified by crystallization from a polar solvent, wherein the products have a purity of at least 96%.

Applicants have amended claims 11 and 12 to incorporate the limitations of original claim 1, which was not rejected by the Dressler reference. Dressler does not disclose the specific reaction of reacting phenols with an oxirane compound with the use of an anion exchange resin as a catalyst, as required by the amended claims. Dressler only discloses a process for preparing hydroxyalkylphenyl ethers by reacting a phenolic or thiophenolic compound with a cyclic organic carbonate compound in the presence of a triorganophosphine compound as a catalyst. (See claim 1 of the reference.)

Furthermore, Dressler does not teach aromatic ethers wherein the content of a metal in the aromatic ethers is less than 100 ppm by mass and the content of a halogen element is less than 100 ppm by mass, as required by Applicants' claim 12. Less than 100 ppm by mass is equivalent to 99.99% purity, while Dressler only teaches purity of at least 96%. There is no indication in the teachings of Dressler that a purity of 99.99% is or can be achieved.

Therefore, the invention of claims 11 and 12 is clearly patentable over Dressler.

The rejection of claim 12 under 35 U.S.C. § 102(b) as being anticipated by Summer et al. is respectfully traversed.

The Examiner takes the position that Summer et al. teach a high purity aromatic ether having an alcoholic hydroxyl group, i.e., resorcinol bis(dihydroxyethyl)ether. The Examiner asserts that the purified product of Summer et al. is not disclosed as having any metal or halogen content.

However, the Examiner has provided no evidence that Summer et al. teaches Applicants' claimed purity levels. Summer et al. do not state that their product has less than 100 ppm by mass of metal and less than 100 ppm by mass of a halogen element. The reference is completely silent on the purity level.

Additionally, Applicants have amended claim 12 to incorporate the limitations of original claim 1, which was not rejected by the Summer et al. reference. Although claim 12 is in product by process form, MPEP § 2113 states that the structure implied by the process steps should be

considered when assessing the patentability of product-by-process claims where the manufacturing process steps would be expected to impart distinctive structural characteristics to the final product. The claimed amount of metal and halogen element in Applicants' aromatic ethers is a result of the specific manufacturing process set forth in the claims. (See page 29, line 21 to page 30, line 4 of Applicants' specification.) Therefore, Summer et al. do not anticipate Applicants' claim 12, because Summer et al. do not disclose aromatic ethers producible by reacting phenols with an oxirane compound with use of an anion exchange resin as a catalyst, nor do Summer et al. teach Applicants' claimed purity levels, which are a result of the specifically claimed process.

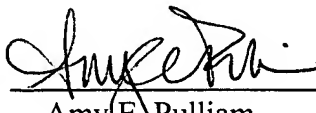
Summer et al. disclose a process for preparation of resorcinol bis(hydroxyethyl)ether by first contacting resorcinol with ethylene carbonate in the presence of water and an alkali metal carbonate and then adding a solution of water and an alkali metal hydroxide and then recovering the resorcinol bis(hydroxyethyl)ether by crystallization. (See the abstract and claim 1 of the Summer et al. reference.) One of ordinary skill in the art would expect the product of Summer et al. to contain an alkali metal in an amount which is higher than 100 ppm by mass. In fact, Summer et al. do not disclose any specific purification method to provide a high purity product, except conventional crystallization. The Examiner has provided no evidence that the product of Summer et al. has the purity levels required by Applicants' claim 12.

For the above reasons, the invention of claim 12 is patentable over Summer et al.

Therefore, in view of the foregoing amendments and remarks, it is submitted that each of the grounds of objection and rejection set forth by the Examiner has been overcome, and that the application is in condition for allowance. Such allowance is solicited.

Respectfully submitted,

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